DOCKET FILE COPY ORIGINAL

Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
The Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band	)	IB Docket No. 99-81
	)	
	)	

RECEIVED
JUN 24 1999
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

COMMENTS

Robert A. Mazer
Albert Shuldiner
Counsel Vinson & Elkins L.L.P.
1455 Pennsylvania Avenue, N.W.
Washington, DC 20004-1008
(202) 639-6500
Counsel for Constellation Communications, Inc.

Dated: June 24, 1999

No. of Copies rec'd 0+4
List ABCDE

Executive Summary

Constellation agrees with the Commission's preliminary conclusion that all of the pending applications can be accommodated under a suitable frequency assignment plan. The Commission should not construe an applicant's request for authority to operate across the entire 2 GHz MSS band as a requirement for the assignment of that amount of spectrum to the applicant on an exclusive basis. Sharing of the allocated MSS spectrum among competing systems within a Commission specified frequency assignment plan is a well-established approach to resolving MSS application rounds.[1] Since all of the pending applications can be accommodated, Constellation believes that only minimal qualification requirements should be imposed on 2 GHz MSS applicants.

Constellation generally supports the Commission's proposal to extend the current technical qualifications applicable to the 1.6/2.4 GHz MSS to the 2 GHz MSS. However, it is not clear whether a 2 GHz system covered by a Letter of Intent ("LOI") is required to provide the same level of coverage of the United States as a Commission licensed system in order to receive parity in the Commission's frequency assignment procedure. Another question involves the proposed new Section 25.143(b)(2)(iv) which requires a 2 GHz MSS system using only geostationary ("GSO") satellites to provide continuous 50 state service "*if technically feasible*." The technical feasibility of service will depend on the minimum elevation angle at which service is provided, the longitude of the sub-satellite point, and the service link antenna beam coverage patterns. While it may not be "technically feasible" to provide continuous 50 state coverage from a system designed primarily to serve another country or oceanic areas, a Commission-

---

[1] *See e.g. Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands*, CC Docket No. 92-166, *Report and Order* (Oct. 14, 1994).

licensed GSO-only 2 GHz MSS system should be designed to provide continuous 50 state service "*unless technically infeasible.*" Constellation requests that the Commission clarify the proposed rule to reflect this requirement.

Constellation supports the Commission's conclusions that a frequency assignment procedure can be fashioned that accommodates all applicants, and that an examination is not required of the financial qualifications of any of the 2 GHz MSS applicants. However, in the event that the Commission determines that all proposed systems cannot be accommodated, Constellation does not agree that the Commission can simply apply the financial qualification standards of Section 25.143(b)(3) without providing additional guidance on what would constitute an adequate level of commitment. The basic financial qualification standard embodied in that section of the rules was adopted in 1985 for the domestic fixed satellite service. At that time, the cost to construct and launch a satellite was on the order of $100 million, and the financing of a satellite by a large corporation solely from internal funds was a possibility. However, as demonstrated in the case of the 1.6/2.4 GHz MSS, a nongeostationary orbit ("NGSO") system requires investment measured in the billions of dollars. No single company is going to commit all the funds necessary for its construction as a practical matter. Regardless of the internal assets of an applicant, a single applicant will not irrevocably commit sufficient internal assets to cover the entire cost of a multi-billion dollar NGSO MSS system. Realistically, funding of such systems will occur in stages over a period of years, with a variety of internal, private and public funding sources accessed depending on the then current market conditions. Thus, if the Commission finds it necessary at some point to impose financial qualifications, it will have to modify the provisions of Section 25.143(b)(3) to reflect the realities of financing multi-billion dollar satellite systems under the then current market conditions.

Constellation opposes the designation of any 2 GHz MSS system as operating in the aeronautical mobile satellite (R) service ("AMS(R)S") or as providing AMS(R)S services, such as that proposed by Boeing in its application. Such a designation carries with it, either implicitly or explicitly, the need for special protection that will adversely affect other operators. The level of protection required for such AMS(R)S operations is incompatible with the basic objective of the 2 GHz MSS allocations to provide the satellite component of third generation personal communications networks.

Constellation agrees that the use of 1.25 MHz increments for frequency assignments in the 2 GHz MSS bands is reasonable at the current time.[2] However, the Commission should treat such a bandwidth increment only as a guideline for the present, and should recognize that this value can be revised at a later date as system implementation proceeds and the air interface standards for the 2 GHz MSS bands are better defined. Flexibility in adjusting the size of the increment of frequency assignments may be particularly important to 2 GHz MSS system operators sharing the same operating band for wideband CDMA.

Constellation also agrees that GSO systems should be assigned frequencies in the portion of the 2 GHz bands available only in Region 2.[3] The Commission should maximize access by NGSO systems to those portions of the 2 GHz MSS bands that are available in all 3 Regions. The GSO systems should be placed at the top of the uplink band and the bottom of the downlink band (*i.e.*, generally in the spectrum allocated to 2 GHz MSS in Region 2 only), and the NGSO systems should be placed at the bottom of the uplink band and the top of the downlink band (*i.e.*, generally in the spectrum allocated to 2 GHz MSS in all 3 Regions). In this regard, the

---

2 *See Notice* at ¶ 27.

3 *See Id.* at ¶ 28.

Commission should recognize that NGSO systems should be capable of operating in the 1980-1990 MHz band outside of the United States where this band is allocated for MSS in all 3 Regions, and the Commission should authorize its licensees to operate outside of the United States in the 1980-1990 MHz band subject to the protection of terrestrial systems within the United States.

With respect to the spectrum initially assigned to systems that ultimately are not implemented,[4] Constellation believes that no future processing round for 2 GHz MSS applications or LOIs should be entertained by the Commission until (a) all of the pending applicants either have implemented their systems or have failed to meet their milestones and have had their authorizations revoked and (b) the Commission finds that the remaining 2 GHz MSS systems from the current processing group cannot make efficient utilization of the available 2 GHz MSS spectrum due to design limitations. The Commission should recognize that, as a practical matter, all 2 GHz MSS systems will be designed with some excess power margin that can be used to provide additional capacity if additional spectrum is made available as a result of the failure of other applicants in this processing round to implement their systems. System operators in this processing round should be permitted to derive the maximum possible capacity from their systems in order to minimize the cost of providing service to the public before entertaining another processing round.

With respect to the amount of spectrum initially assigned to 2 GHz MSS systems,[5] Constellation believes that the Commission should indicate the minimum amount of spectrum guaranteed to each system, and each system operator should then design its system with enough

---

4 *See Id.* at ¶29.

5 *See Id.* at ¶ 30.

capacity to be economically viable within that spectrum constraint. As noted by the Commission, the 3.75 MHz per applicant available in the 2 GHz MSS allocations is comparable to the gross amount of spectrum available per system in the 1.6/2.4 GHz MSS bands. If an applicant is permitted to demand more than 3.75 MHz of service link spectrum in each direction at the outset, then the Commission will be in the undesirable position of having to pick and choose among differing designs or business plans. Nevertheless, all systems should be designed to be capable of operating across the entire 2 GHz MSS allocation to provide flexibility in implementing the 2 GHz MSS frequency assignment plan even though actual operations will be limited to only a portion of the band.

Constellation does not believe that any of the approaches described in the Notice, by itself, satisfies all of the concerns raised by the Commission or Constellation. Instead, a modification of the Traditional Band Approach with some of the elements of the Negotiated Entry Approach appears to be the best basis for defining a frequency assignment approach to resolve this proceeding.

Specifically, Constellation proposes that the Commission establish a procedure under which the pending applicants make an initial choice between an exclusive 3.75 MHz assignment (for either TDMA, CDMA or TDMA/CDMA) which it does not intend to share with any other system, or a 3.75 MHz assignment that may be combined with another 3.75 MHz segment initially assigned to another applicant within a CDMA band segment where operators will try to reach agreements to operate CDMA or CDMA/TDMA using cross-polarization for isolation. For example, two CDMA applicants may agree to aggregate their assignments into a single 7.5 MHz assignment and to operate with opposite polarizations within the assigned band segment. To implement this approach, the Commission would set one date for each applicant to announce its

selection, and then allow a limited period of time, e.g. 90 days, for applicants to voluntarily work out an initial assignment plan. Such a plan would form an initial baseline for future coordination activities. In the event that difficulties remain, the Commission can review the proposals and issue an initial 2 GHz MSS frequency assignment which resolves outstanding issues.

After the initial assignments are made by the Commission and as systems are implemented, system operators should negotiate the technical details of the plans and any changes in the initial assignment plan requests for authority to operate in a 3.75 MHz portion of the band that differs from its initial assignment. For example, such requests can result from changes in the air interface design of a system or may be based on minimizing the costs of terrestrial relocation. If agreement can not be reached directly by the parties affected, the assistance of the Commission can be requested, or the Commission can grant temporary authorization to use a requested band segment subject to termination once the original assignee's system is ready for service.

If a system operator fails to meet its milestones and the Commission declares, after notice and opportunity for comment, its authorization is null and void, that assignment should, in principle, be divided proportionately among the remaining operators. However, it also has to be recognized that CDMA channels have a relatively wide bandwidth, and it may be more appropriate to reassign the spectrum into a TDMA pool assigned proportionately among the TDMA operators and a CDMA pool accessed by all CDMA operators on a proportionate power basis.

Coordination agreements will have to be reached with non-U.S. satellite systems operating in the 2 GHz MSS band. Any U.S. frequency assignment plan adopted by the Commission in this proceeding is likely to entail a significant amount of flexibility in the actual operating frequencies of individual systems which may vary over time. As a practical matter, sharing arrangements between TDMA systems will probably be on a band segmentation

approach, while CDMA systems coordination is likely to be done on the bases of aggregate power density limits and selection of polarization. It may therefore be possible to achieve some general coordination agreements with other countries on the basis of such an assignment plan without necessarily associating a particular band segment with a particular system. However, mechanisms would be needed to update such agreements over time to respond to changing circumstances. The Commission also needs to coordinate the activities of all of the parties involved in its 2 GHz frequency assignment plan to insure that the rights of its licensees under the 2 GHz frequency assignment plan are fully reflected under any coordination agreements reached through the ITU procedures. In any event, it is difficult to offer specific proposals on this issue until the Commission adopts its 2 GHz MSS frequency assignment plan.

Constellation believes that the current milestone structure for 1.6/2.4 GHz MSS systems is appropriate for 2 GHz MSS systems. However, the date on which the milestones schedule starts needs to be tailored to each licensee based on its current position. For example, for new entrants with no existing facilities, the milestone schedule can begin on the date of the license grant. However, for existing 1.6/2.4 GHz MSS licensees, the milestone schedule should begin at a date tailored to fit into a second generation or follow-on system launch scenario.

TABLE OF CONTENTS

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
The Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band	)	IB Docket No. 99-81

COMMENTS

Constellation Communications, Inc. ("Constellation"), by its counsel, hereby submits these comments in the above-referenced proceeding. On March 18, 1999, the Commission released a Notice of Proposed Rule Making[1] to amend its Rules to initiate the licensing of a new generation of Mobile Satellite Service ("MSS") systems in the 2 GHz band. These proposed rules would establish a licensing process to govern the authorization of both United States systems licensed by the Commission and non-U.S. systems for which Letters of Intent ("LOI") have been filed. In addition, the Commission is proposing service rules, based on the service rules previously adopted for 1.6/2.4 GHz MSS systems, to govern the licensing and operation of these 2 GHz MSS systems.

Constellation holds a license to construct and operate a 1.6/2.4 GHz MSS system,[2] and has pending before the Commission an application for authorization to

---

1 *The Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band*, IB Docket No. 99-81, *Notice of Proposal Rulemaking* (March 25, 1999) ("*Notice*").

2 *Constellation Communications, Inc.*, DA 97-1366 (July 1, 1997).

launch and operate a 2 GHz MSS system.[3] Constellation therefore has a significant interest in this proceeding and in the efficient implementation of the 2 GHz MSS. Constellation supports the general objectives of the Commission's proposals that will allow all of the pending applicants to be accommodated. As discussed below, Constellation believes that an appropriate frequency assignment procedure should be based on the Traditional Band Approach, but would be modified to include some features of the Negotiated Entry Approach to provide the necessary flexibility required for system operators to efficiently implement their systems. In addition, while the existing service rules for the 1.6/2.4 GHz MSS form a sound basis for the 2 GHz MSS service rules, several modifications or clarifications are desirable.

I. The Commission Should Adopt Minimal Qualification Requirements For 2 GHz MSS System Licenses

Constellation agrees with the Commission's preliminary conclusion that all of the pending applications can be accommodated under a suitable frequency assignment plan. The Commission should not construe an applicant's request for authority to operate across the entire 2 GHz MSS band as a requirement for the assignment of that amount of spectrum to the applicant on an exclusive basis. Sharing of the allocated MSS spectrum among competing systems within a Commission specified frequency assignment plan is a well-established approach to resolving MSS application rounds.[4] Since all of the pending applications can be accommodated, Constellation believes that only minimal qualification requirements should be imposed on 2 GHz MSS applicants.

---

[3] Application of Constellation Communications, Inc., File Number 181-SAT-P/LA-97(46). *See Notice* at footnote 18, page 5.

[4] *See e.g. Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands*, CC Docket No. 92-166, *Report and Order* (Oct. 14, 1994).

Constellation generally supports the Commission's proposal to extend the current technical qualifications applicable to the 1.6/2.4 GHz MSS to the 2 GHz MSS. However, it is not clear whether a 2 GHz system covered by a Letter of Intent ("LOI") is required to provide the same level of coverage of the United States as a Commission licensed system in order to receive parity in the Commission's frequency assignment procedure. Another question involves the proposed new Section 25.143(b)(2)(iv) which requires a 2 GHz MSS system using only geostationary ("GSO") satellites to provide continuous 50 state service "*if technically feasible.*" The technical feasibility of service will depend on the minimum elevation angle at which service is provided, the longitude of the sub-satellite point, and the service link antenna beam coverage patterns. While it may not be "technically feasible" to provide continuous 50 state coverage from a system designed primarily to serve another country or oceanic areas, a Commission-licensed GSO-only 2 GHz MSS system should be designed to provide continuous 50 state service "*unless technically infeasible.*" Constellation requests that the Commission clarify the proposed rule to reflect this requirement.

Constellation supports the Commission's conclusions that a frequency assignment procedure can be fashioned that accommodates all applicants, and that an examination is not required of the financial qualifications of any of the 2 GHz MSS applicants. However, in the event that the Commission determines that all proposed systems cannot be accommodated, Constellation does not agree that the Commission can simply apply the financial qualification standards of Section 25.143(b)(3) without providing additional guidance on what would constitute an adequate level of commitment. The basic financial qualification standard embodied in that section of the rules was adopted in 1985 for the

domestic fixed satellite service. At that time, the cost to construct and launch a satellite was on the order of $100 million, and the financing of a satellite by a large corporation solely from internal funds was a possibility. However, as demonstrated in the case of the 1.6/2.4 GHz MSS, a nongeostationary orbit ("NGSO") system requires investment measured in the billions of dollars. No single company is going to commit all the funds necessary for its construction as a practical matter. Regardless of the internal assets of an applicant, a single applicant will not irrevocably commit sufficient internal assets to cover the entire cost of a multi-billion dollar NGSO MSS system. Realistically, funding of such systems will occur in stages over a period of years, with a variety of internal, private and public funding sources accessed depending on the then current market conditions. Thus, if the Commission finds it necessary at some point to impose financial qualifications, it will have to modify the provisions of Section 25.143(b)(3) to reflect the realities of financing multi-billion dollar satellite systems under the then current market conditions.

II. The Commission Should Declare That No AMS(R)S Service Will Be Recognized Or Protected In The 2 GHz MSS Bands

Constellation opposes the designation of any 2 GHz MSS system as operating in the aeronautical mobile satellite (R) service ("AMS(R)S") or as providing AMS(R)S services, such as that proposed by Boeing in its application. Such a designation carries with it, either implicitly or explicitly, the need for special protection that will adversely affect other operators. The level of protection required for such AMS(R)S operations is incompatible with the basic objective of the 2 GHz MSS allocations to provide the satellite component of third generation personal communications networks.

An AMS(R)S system will have an adverse impact on commercial 2 GHz MSS systems due to a fundamental difference in system engineering between the commercial MSS industry and the aeronautical safety community. Although commercial MSS systems seek high availability and quality of service, MSS system operators perform an economic trade-off between technical parameters, system capacity, and the cost of providing the service. Unlike commercial systems, the aeronautical safety community is unwilling to accept any limitation on link availability or any interference even under the most demanding of situations. The net effect of this design philosophy is that AMS(R)S systems need to operate at higher transmit power to provide the higher link margins and accept less interference in order to achieve their desired availability and quality of service objectives. Providing this extraordinarily high availability for AMS(R)S unnecessarily will require commercial MSS system operators to substantially reduce the capacity of their systems, and will restrict the Commission's ability to implement any frequency assignment plan.

Although the Commission indicates that it does not presently propose to make any specific accommodations for the provision of AMS(R)S services over 2 GHz MSS systems, it does not explicitly exclude the possibility of *de facto* restrictions on 2 GHz MSS systems that might be imposed in the future if Boeing implements its proposed system. Constellation therefore believes that it is necessary for the Commission to declare explicitly at this point that no AMS(R)S operations or service will be recognized or protected in its 2 GHz MSS frequency assignment plan.

III. The Commission Should Rely on Band Plan Arrangements, Not Auctions, to Resolve Mutual Exclusivity

Constellation encourages the Commission to rely on band plan arrangements to resolve this proceeding and facilitate prompt licensing of competitive 2 GHz MSS systems.

A. Auctions Present Unique Problems for Global Satellite Systems

Competitive bidding or auctions is very problematic for global satellite systems. The initiation of auctions in the United States may lead to auctions of 2 GHz MSS landing rights throughout the world and may trigger auctions of landing rights for other global satellite systems such as the Big LEO, Little LEO and Non-Geostationary FSS systems. The advent of worldwide sequential auctions would undercut any applicant's ability to judge the correct market value of the initial auction in the United States and may raise costs for 2 GHz MSS implementation to the point where system implementation is foreclosed.

Constellation is also concerned that the specter of sequential auctions may actually cause significant delays in the introduction of competitive 2 GHz MSS systems. Unlike the current situation where FCC licensing is the final regulatory hurdle for system implementation, U.S. licensees may be forced to postpone system implementation until completion of sequential auctions in ten or fifteen countries which have the largest potential markets.

The uncertainties created by auctions also increase the probability that capital markets will withhold funding for 2 GHz MSS systems until worldwide authorizations are obtained. The additional cost of worldwide auctions would put 2 GHz MSS systems at a competitive disadvantage vis-à-vis other MSS service providers. Again, this problem

would only serve to make the 2 GHz MSS less attractive for investment and to further delay introduction of new competitive MSS systems.

B. Comments on the Auction Process

Although Constellation strongly opposes auctions, if the Commission determines that an auction is the only practical means for awarding licenses, it should structure any auction rule for this service around the following methodology. Specifically, Constellation would support the Commission's proposal to provide assignments in paired units of 1.25 MHz. Furthermore, we do believe there should be a limit on the number of licenses awarded to a single entity. To do otherwise would merely reduce competition by limiting the number of MSS suppliers. It could also result in providing a 2 GHz licensee a significant competitive advantage vis-à-vis other MSS systems operating in other bands. Constellation supports the adoption of the FCC's general competitive bidding rules in Part 1 Subpart Q of the Commission's Rules. Finally, Constellation strongly believes that individual licensees should be allowed to aggregate their spectrum in larger blocks in order to facilitate co-frequency sharing. To do otherwise would merely result in the limited amount of 2 GHz spectrum not being used in the most spectrally efficient manner possible.

IV. The Commission Should Adopt A Modified Version Of The Traditional Band Approach That Guarantees A Minimum 3.75 MHz Assignment In Developing A Frequency Assignment Plan For The 2 GHz MSS Band

Constellation believes that the Commission should adopt a processing procedure that (a) accommodates all pending applicants, (b) is flexible enough to accommodate the variations in implementation plans and status of the pending applicants in a fair manner, and (c) provides a sound basis for system design and financing activities. In this section,

Constellation first comments on several preliminary issues raised by the Commission in its Notice, and then on the issues raised by each of the three basic frequency assignment approaches described in the Notice. Constellation concludes that none of the three, as proposed, is adequate. However, the Traditional Band Approach, together with some of the best elements for the Negotiated Entry Approach, provides the best means of resolving this proceeding.

A. Comments on the Preliminary Matters Raised by the Commission

Constellation agrees that the use of 1.25 MHz increments for frequency assignments in the 2 GHz MSS bands is reasonable at the current time.[5] However, the Commission should treat such a bandwidth increment only as a guideline for the present, and should recognize that this value can be revised at a later date as system implementation proceeds and the air interface standards for the 2 GHz MSS bands are better defined. Flexibility in adjusting the size of the increment of frequency assignments may be particularly important to 2 GHz MSS system operators sharing the same operating band for wideband CDMA.

Constellation also agrees that GSO systems should be assigned frequencies in the portion of the 2 GHz bands available only in Region 2.[6] The Commission should maximize access by NGSO systems to those portions of the 2 GHz MSS bands that are available in all 3 Regions. The GSO systems should be placed at the top of the uplink band and the bottom of the downlink band (*i.e.*, generally in the spectrum allocated to 2 GHz MSS in Region 2 only), and the NGSO systems should be placed at the bottom of the

---

5 *See Notice* at ¶ 27.

6 *See Id.* at ¶ 28.

uplink band and the top of the downlink band (*i.e.*, generally in the spectrum allocated to 2 GHz MSS in all 3 Regions). In this regard, the Commission should recognize that NGSO systems should be capable of operating in the 1980-1990 MHz band outside of the United States where this band is allocated for MSS in all 3 Regions, and the Commission should authorize its licensees to operate outside of the United States in the 1980-1990 MHz band subject to the protection of terrestrial systems within the United States.

With respect to the spectrum initially assigned to systems that ultimately are not implemented,[7] Constellation believes that no future processing round for 2 GHz MSS applications or LOIs should be entertained by the Commission until (a) all of the pending applicants either have implemented their systems or have failed to meet their milestones and have had their authorizations revoked and (b) the Commission finds that the remaining 2 GHz MSS systems from the current processing group cannot make efficient utilization of the available 2 GHz MSS spectrum due to design limitations. The Commission should recognize that, as a practical matter, all 2 GHz MSS systems will be designed with some excess power margin that can be used to provide additional capacity if additional spectrum is made available as a result of the failure of other applicants in this processing round to implement their systems. System operators in this processing round should be permitted to derive the maximum possible capacity from their systems in order to minimize the cost of providing service to the public before entertaining another processing round.

---

[7] *See Id.* at ¶29.

With respect to the amount of spectrum initially assigned to 2 GHz MSS systems,[8] Constellation believes that the Commission should indicate the minimum amount of spectrum guaranteed to each system, and each system operator should then design its system with enough capacity to be economically viable within that spectrum constraint. As noted by the Commission, the 3.75 MHz per applicant available in the 2 GHz MSS allocations is comparable to the gross amount of spectrum available per system in the 1.6/2.4 GHz MSS bands. If an applicant is permitted to demand more than 3.75 MHz of service link spectrum in each direction at the outset, then the Commission will be in the undesirable position of having to pick and choose among differing designs or business plans. Nevertheless, all systems should be designed to be capable of operating across the entire 2 GHz MSS allocation to provide flexibility in implementing the 2 GHz MSS frequency assignment plan even though actual operations will be limited to only a portion of the band.

B. Comments On Proposed Frequency Assignment Approaches

Each of the three frequency assignment approaches proposed by the Commission has advantages and disadvantages. Constellation offers its views on the issues raised by each of the proposed approaches in the following sections.

a) Flexible Band Arrangement

Under the Flexible Band Arrangement, the 2 GHz MSS bands would be segmented into three "core" and two "expansion" spectrum bands, with each core band used by systems with similar technologies to commence operations, and each expansion band held in reserve. The core time division multiple access ("TDMA") spectrum is divided into two

---

[8] *See Id.* at ¶ 30.

distinct segments, GSO TDMA and NGSO TDMA, with the code division multiple access ("CDMA") core spectrum placed between the two TDMA core bands. The CDMA operators would be allowed to aggregate their assigned spectrum into a contiguous spectrum segment, if it were advantageous to do so.

One major difficulty with this proposed approach is the requirement for early selection of a multiple access technique which may preclude the implementation of more efficient air interface standards currently under development, particularly with respect to the possibility of using both CDMA and TDMA in the same system. In this regard, it is not clear that separate assignments have to be made for the TDMA and CDMA components of a hybrid TDMA/CDMA system. In theory, TDMA and CDMA could exist in the same band if the density of TDMA carriers is not too high and/or enough isolation is provided by cross-polarization or CDMA processing gain. Thus, it might be possible to use one polarization for a number of TDMA carriers and the opposite sense for CDMA. Or, more likely, two systems could operate on different polarizations with a combination of CDMA and TDMA as long as the TDMA carriers of different systems did not overlap. Also, the proposed approach of assigning a 1.25 MHz TDMA segment and a 1.25 MHz CDMA segment to a hybrid TDMA/CDMA system appears to predetermine a 50%/50% usage split between TDMA and CDMA in the same system, which may not turn out to be the case in the actual system, and limits the CDMA processing gain available for higher data rate services. The result may be inefficient spectrum utilization.

Constellation sees no purpose to be served by initially reserving pools of spectrum to be assigned for future expansion. If 3.75 MHz of service link spectrum in each direction is available at the outset for each applicant, then it is the minimum that should be assigned

to each system. Such an assignment will allow the system operators to base their system designs and business plans on the guarantee that at least this minimum amount of spectrum will in fact be available for their use. This is particularly relevant for CDMA systems, which need to know the maximum possible chipping rate (and thus carrier bandwidth) so that operators can design their CDMA air interfaces to maximize processing gain by higher chip rates for the higher speed data services planned for this band.

Constellation does not believe that the initial assignment of specific bands to systems necessarily leads to inefficient spectrum utilization if the 2 GHz MSS systems have different implementation schedules or if some do not proceed with implementation.[9] As a practical matter, satellite system usage is low at the time the system is initially placed into service and grows over time. Moreover, even the Commission noted that "[w]e expect the 2 GHz MSS operators to have spectrum requirements that will be modest initially, but that will increase following the commencement of operations."[10] Thus, there should be no need for an early system to access more than its initial 3.75 MHz frequency assignment, with two possible exceptions. One is the case where two or more CDMA systems have aggregated their spectrum to operate in a CDMA band segment wider than 3.75 MHz. But this case can be covered under the basic procedures of the assignment plan. The other case is to initially operate over a wider operating band segment to minimize the costs of terrestrial system relocation. However, any such use should be negotiated among the operators involved, including firm schedules for shifting operating frequencies into the

---

9 *See Id.* at ¶ 32.

10 *See Id.* at ¶ 39.

assigned band segment, rather than assigning a smaller core spectrum assignment with a future determination on expansion spectrum.

Another problem with the concept of expansion spectrum is that the need for the additional spectrum is lowest at the beginning of a system's operations and grows as the number of subscribers grows. Early entrants, therefore, have every incentive to spread their operations over the initial core assignment in order to justify the early assignment of expansion spectrum. Early entrants should be limited to the same 3.75 MHz initial assignment guaranteed to later entrants until additional 2 GHz MSS spectrum is made available for re-assignment from systems that are not implemented.

Moreover, reassignment of spectrum should be on a proportionate basis to the remaining systems unless a system is not technically capable of efficiently utilizing additional spectrum to derive additional capacity, e.g. because of power limitations on the satellite. Assignment of additional spectrum based on a determination of whether a system's "customer traffic requirements"[11] has grown beyond the capacity of the initial assignment will involve the Commission in complex analyses of system technical designs and capacity trade-offs. Another difficulty with such a criteria is to quantify "customer traffic requirements" and the basis on which it is defined and compared among different system designs. For example, traffic requirements specified in terms of minutes of use or circuit capacity require equivalence factors to be developed to relate differences between systems in vocoder or data rates, service quality, link margin, etc. In addition, it has to be recognized that rate stimulation or other techniques can be used to artificially peak "traffic

---

11 *See Id.* at ¶ 33.

requirements" prior to the request for assignment of additional spectrum if such a criteria is employed.

The Commission's proposal for a phased-in approach to spectrum expansion, *i.e.*, systems would expand in blocks of 1.25 MHz, could be impractical or unfair to CDMA systems. Future CDMA systems are likely to use high chipping rates in order to maintain CDMA processing gains for the higher baseband data rates anticipated in the 2 GHz bands. Thus, it may be likely that standard CDMA emission bandwidths on the order of the terrestrial wideband CDMA standard of 5 MHz may be desirable for the satellite component of future personal communications networks. This would require the aggregation of CDMA assignments in larger bandwidth increments.[12]

With respect to Boeing's proposal for an Aviation Traffic Information Service requiring 600 kHz of TDMA downlink spectrum only,[13] Constellation agrees with the Commission that because Boeing's request for spectrum is unbalanced, it would result in inefficient use of service link spectrum. Moreover, as discussed above, Boeing should not be allowed to designate any carrier for a Traffic Information Service if this service could be construed as AMS(R)S.

The Commission notes that the Flexible Band Arrangement would not provide guard bands to mitigate the effects of interference from systems operating in adjacent bands, particularly between CDMA and TDMA technologies.[14] Constellation does not believe that any required guardbands should be specified initially by the Commission.

---

12 An obvious example would be for two CDMA systems to aggregate their 3.75 MHz basic assignments to permit them to use bandwidths as wide as 7.5 MHz on one sense of polarization, and using opposite senses of polarization for isolation of co-frequency transmissions.

13 *See Id.* at ¶ 33.

14 *See Id.* at ¶ 38.

Instead, it would be preferable for the system operators to negotiate appropriate levels of adjacent channel interference and any necessary guardbands as part of inter-system coordination. This is particularly important to allow system operators to use the most current waveform parameters and standards available at the time the technical parameters of their system proposals and air interfaces are finalized.

Constellation believes that the Commission has identified a significant disadvantage of the Flexible Band Arrangement in that designating TDMA and CDMA assignments using the current 2 GHz MSS proposals will limit the ability of system operators to embrace new technologies when implementing their systems.[15] There is much new work being done in the area of air interface standards for the next generation of mobile and personal communications services, including a satellite component, which may have a significant impact on the choice of waveform to be implemented over 2 GHz MSS systems. One of the advantages of satellite architectures using simple frequency changing transponders is flexibility in the choice of operating waveform. Given the rapid progress being made in this area, flexibility should be afforded 2 GHz MSS licensees to use the most effective and economic waveform at the time each system is implemented. The technical and regulatory factors that drove four of the five Big LEO systems to select CDMA in the 1.6/2.4 GHz MSS bands are not the same as the those facing applicants in the 2 GHz MSS bands. As a result, 2 GHz MSS applicants should not be required to make irrevocable elections between CDMA or TDMA prematurely.

The Commission also notes that the Flexible Band Arrangement may also limit its ability to consider the possibility of adopting a transitional relocation policy for incumbent

---

15 *See Id.* at ¶ 39.

licensees in the 2 GHz MSS bands.[16] Constellation agrees with this observation and believes that flexibility should be provided to operating systems to minimize the costs of terrestrial relocation during the early years of operation. Flexibility to shift operating frequencies within a system, subject to appropriate coordination agreements, will be an important element is this regard.

b) Negotiated Entry Approach

Under the Negotiated Entry Approach, all qualified entities would be issued conditional authorizations to provide service anywhere in the 2 GHz MSS band. This authorization would be conditioned on negotiation among the system proponents as to which frequencies each system would utilize, and on technical coordination among the system proponents as to the operational parameters of each system so as not to cause harmful interference to any other authorized 2 GHz MSS system.

Constellation's principal concern with this approach is the potential for systems that are implemented early to begin their operations on the most favorable frequencies and make it difficult for later implemented system systems to operate economically and efficiently within the remainder of the 2 GHz MSS band. Early systems are likely to select portions of the 2 GHz bands that are least costly to implement from a terrestrial relocation point of view. Moreover, early decisions regarding segmentation of the bands between CDMA and TDMA operations, or between GSO and NGSO systems, may make it more difficult for later systems to optimize their capacity in the resultant sharing environment. In principal, later systems should not be required to bear a disproportionate loss in operational flexibility or capacity loss in the sharing environment.

---

[16] *See Id.* at ¶ 39.

Constellation believes that all licensed operators must be a full participant of any frequency assignment approach in order to guarantee their access to their proportion of the spectrum resource at the time they implement their systems. While there is some merit in deferring detailed negotiations on technical and operational conditions of a coordination agreement until a system operator has prepared detailed specifications for its system and air interface parameters, certain issues, such as sense of polarization and aggregation of CDMA operator spectrum, should be accommodated at as early a date as practical. Thus, all 2 GHz MSS applicants should be included to at least some degree in the technical negotiations needed to implement the Commission's 2 GHz MSS frequency assignment plan.

Constellation believes that, in general, the Commission can rely on good faith negotiation and coordination among the systems to complete coordination agreements, as long as there is a defined framework in which to conduct the negotiations. However, as noted by the Commission, problems could arise when up to nine separate entities attempt to negotiate and coordinate with each other. In addition, earlier entrants may achieve a strategic advantage in using the spectrum, mitigating their desire to negotiate in good faith with subsequent entrants, and consequently, slowing entry by other system operators.[17]

In particular, the Negotiated Entry Approach provides early entrants with the ability to pick segments of the 2 GHz MSS band that minimize their costs of relocating terrestrial systems, as well as optimizing inter-system coordination agreements. Later entrants may be left with the more expensive portions of the 2 GHz bands to clear and may find it more difficult to optimize their inter-system coordination around the initial operations of the

---

[17] *See Id.* at ¶ 41.

early entrants. For these reasons, Constellation believes that the proposed Negotiated Entry Approach is undesirable because it has no structure that guarantees that later entrants will have comparable spectrum available to them when they implement their systems.

The required structure of any 2 GHz MSS frequency assignment plan includes the provision to each system of a guaranteed amount of spectrum, i.e. 3.75 MHz of service link spectrum in both directions, on which it is entitled to operate upon commencement of service. As systems forfeit authorizations through missed milestones, that system's guaranteed spectrum would be available for automatic reauthorization to the other licensees in this processing round. Certainly some form of division of the band between TDMA/CDMA modulation schemes or GSO/NGSO orbital designs will be needed to increase the probability of successful long term coordination by reducing the number of system proponents with which operators would have to negotiate.

Under any frequency assignment approach, Constellation fully expects that the operators would negotiate spectrum location of the 2 GHz MSS band in good faith, and successfully complete technical coordination. If difficulties arise in the completion of negotiations and coordination, the Commission should be available to facilitate resolution of disputes.

Finally, Constellation believes that an unstructured Negotiated Entry Approach, as proposed in the Notice, is likely to undercut the viability of a license to attract the necessary investment to finance the system.[18] Such investment must be based on business plans which can confidently predict a minimum amount of capacity being available to justify minimum projected revenue based on engineering analyses of available spectrum and inter-

---

[18] *See Id.* at ¶ 43.

system interference levels. Uncertainty that such a minimum amount of spectrum or system capacity will be available under the Commission's authorization may significantly deter investment.

c) Traditional Band Arrangement

The third band sharing proposal is the Traditional Band Arrangement. Under this approach, the Commission would provide a specific spectrum band for each qualified system, i.e. a total of 7.5 MHz: 3.75 MHz for the uplink and 3.75 MHz for the downlink. Spectrum not assigned to systems would be used to provide 0.625 MHz guard bands between TDMA and CDMA operations to mitigate the potential adjacent band interference between systems with different technological configurations.

Constellation believes that the Traditional Band Approach is very similar to the Flexible Band Approach, except that the problems of the core/expansion segments of the Flexible Band Approach are eliminated by the assignment of 3.75 MHz of service link spectrum in each direction to each applicant from the outset. Accordingly, many of the Constellation's comments on other aspects of the Flexible Band approach are equally applicable to the Traditional Band Approach. However, Constellation believes that the Traditional Band Approach provides the best basis from which to construct a workable frequency assignment plan for the 2 GHz MSS Service because of the guaranteed spectrum access provided by this approach. Nevertheless, additional flexibility should be added to this approach to accommodate the current uncertainties in system implementation.

C. Constellation's Proposed Approach

Constellation does not believe that any of the approaches described in the Notice, by itself, satisfies all of the concerns raised by the Commission or Constellation. Instead, a

modification of the Traditional Band Approach with some of the elements of the Negotiated Entry Approach appears to be the best basis for defining a frequency assignment approach to resolve this proceeding.

Specifically, Constellation proposes that the Commission establish a procedure under which the pending applicants make an initial choice between an exclusive 3.75 MHz assignment (for either TDMA, CDMA or TDMA/CDMA) which it does not intend to share with any other system, or a 3.75 MHz assignment that may be combined with another 3.75 MHz segment initially assigned to another applicant within a CDMA band segment where operators will try to reach agreements to operate CDMA or CDMA/TDMA using cross-polarization for isolation. For example, two CDMA applicants may agree to aggregate their assignments into a single 7.5 MHz assignment and to operate with opposite polarizations within the assigned band segment. To implement this approach, the Commission would set one date for each applicant to announce its selection, and then allow a limited period of time, e.g. 90 days, for applicants to voluntarily work out an initial assignment plan. Such a plan would form an initial baseline for future coordination activities. In the event that difficulties remain, the Commission can review the proposals and issue an initial 2 GHz MSS frequency assignment which resolves outstanding issues.

After the initial assignments are made by the Commission and as systems are implemented, system operators should negotiate the technical details of the plans and any changes in the initial assignment plan requests for authority to operate in a 3.75 MHz portion of the band that differs from its initial assignment. For example, such requests can result from changes in the air interface design of a system or may be based on minimizing the costs of terrestrial relocation. If agreement can not be reached directly by the parties

affected, the assistance of the Commission can be requested, or the Commission can grant temporary authorization to use a requested band segment subject to termination once the original assignee's system is ready for service.

If a system operator fails to meet its milestones and the Commission declares, after notice and opportunity for comment, its authorization is null and void, that assignment should, in principle, be divided proportionately among the remaining operators. However, it also has to be recognized that CDMA channels have a relatively wide bandwidth, and it may be more appropriate to reassign the spectrum into a TDMA pool assigned proportionately among the TDMA operators and a CDMA pool accessed by all CDMA operators on a proportionate power basis.

V. The Commission Should Immediately Assign Certain C and Ku Bands Allocated to NGSO Feeder Links As Requested By the Applicants

In its application, Constellation is proposing to utilize the 5091-5250 MHz, 6700-7075 MHz, and 15.43-15.63 GHz[19] bands. At the present time, a total of four companies, including Constellation, are proposing to use these bands for feeder links to 1.6/2.4 GHz and/or 2 GHz NGSO MSS systems. Constellation believes that it should be possible for all of these systems to share the bands under suitable coordination agreements. Thus, Constellation believes that the Commission can grant the four companies licenses to use these three feeder link bands subject to mutual coordination. However, Constellation believes that suitable recognition must be given to accommodating the designs of currently licensed 1.6/2.4 GHz MSS systems in these feeder link bands in the course of

---

[19] Although Constellation's application proposes use of the 15.45-15.65 MHz band, Constellation plans to conform its proposed frequency plan to the 15.43-15.63 GHz uplink allocation proposed by the Commission in its Notice of Proposed Rule Making in Docket No. ET 98-142, FCC 98-177, released August 4, 1998.

accommodating new 2 GHz MSS systems. This priority is essentially important with respect to 2 GHz MSS applicants who have requested other feeder link bands that may not be ultimately assigned.

With respect to the Commission's question regarding the continued applicability of Section 25.203(k) to 2 GHz MSS systems,[20] it should be noted that this section of the rules relates to the coordination requirements for applications for individual feeder link earth stations. As such, it does not appear to directly address the coordination between system operators. Rather, the basic coordination agreements between system operators should be required as a condition of grant of the space station authorization.

Constellation believes it is premature for the Commission to consider "formulas" or "algorithms" to relate service link assignments with feeder link assignments.[21] Such issues should be addressed in the context of feeder link coordination negotiations.

VI. The Commission Should Clarify Its Policies Regarding International Coordination

Coordination agreements will have to be reached with non-U.S. satellite systems operating in the 2 GHz MSS band. Any U.S. frequency assignment plan adopted by the Commission in this proceeding is likely to entail a significant amount of flexibility in the actual operating frequencies of individual systems which may vary over time. As a practical matter, sharing arrangements between TDMA systems will probably be on a band segmentation approach, while CDMA systems coordination is likely to be done on the bases of aggregate power density limits and selection of polarization. It may therefore be possible to achieve some general coordination agreements with other

---

20 *See Id.* at ¶ 55.

21 *See Id.* at ¶ 55.

countries on the basis of such an assignment plan without necessarily associating a particular band segment with a particular system. However, mechanisms would be needed to update such agreements over time to respond to changing circumstances. The Commission also needs to coordinate the activities of all of the parties involved in its 2 GHz frequency assignment plan to insure that the rights of its licensees under the 2 GHz frequency assignment plan are fully reflected under any coordination agreements reached through the ITU procedures. In any event, it is difficult to offer specific proposals on this issue until the Commission adopts its 2 GHz MSS frequency assignment plan.

VII. The 1.6/2.4 GHz MSS Service Rules Provide A Reasonable Basis For 2 GHz MSS Service Rules, But Some Modifications Are Required To Reflect Differences Between The Two Services

The Commission proposes to apply to the 2 GHz MSS the same service rules as are currently applied to the 1.6/2.4 GHz MSS. Constellation generally supports these proposals, but offers the following comments.

For example, Constellation supports the Commission's proposal to treat the space segment component of 2 GHz MSS as non-common carriage.[22] In its application, Constellation proposes to offer space segment services to its customers on a non-common carrier basis.[23] Constellation plans to negotiate individual contracts with each of its gateway earth station operators and service providers that will be customized for the particular business plan and market condition of that partner. With respect to the use of gateway earth stations for Telemetry, Tracking and Command ("TT&C") operations, Constellation plans to enter into customized contracts with certain gateway operators to

---

22 *Id.* at ¶ 74.

23 *See Constellation Application* at Exhibit 1, page 7.

rent space, utilities, and maintenance services for TT&C equipment racks owned by Constellation and installed by Constellation at such gateway sites. The transmissions carried over these TT&C facilities will be controlled by Constellation from its Satellite Control Center ("SCC"), and the signals will not be provided to the public. Similarly, operational communications between and among gateways, the SCC and the Constellation Network Control Center ("NCC") are private in nature and are not provided to the public. As noted by the Commission, none of these operations should be construed as common carriage.[24] Accordingly, Constellation agrees with the Commission that space segment operations should be classified as non-common carriage.[25]

Constellation generally supports the Commission's proposals to apply the licensing provisions for the 1.6/2.4 GHz MSS to the 2 GHz MSS systems. However, Constellation is concerned with the Commission's proposal to provide different license terms for a system that uses both GSO and NGSO satellites. Since the external interference created by such a system would be the aggregate of both the GSO and NGSO satellites in the system, it would appear that any substantive consideration the Commission may use to renew a license for the system should apply to all components and not be done piecemeal. Thus, a common license term should be applied to a system consisting of both GSO and NGSO satellites.

---

[24] Constellation will interconnect its gateways, SCC and NCC with a highly reliable, private communications network leased from other communications carriers for internal operational communications purposes. Constellation may also decide to route some traffic over this network where it is technically and economically efficient to do so. Use of such facilities would be subject to the individual contracts negotiated by Constellation with its gateway operators and service providers, and as acknowledged by the Commission, would not be regulated as common carriage.

[25] However, Constellation believes that the Commission's analyses does not apply to a 2 GHz MSS system that is characterized as an AMS(R)S system.

A. The Commission Should Establish Flexible Milestone And Reassignment Procedures That Reflect The Realities Of Financing Large Telecommunications Systems

Constellation agrees that the application of strict milestones, such as those proposed by the Commission, are a necessary element of a 2 GHz MSS frequency assignment plan. However, unlike the 1.6/2.4 GHz MSS service where all licensees were new entrants, the 2 GHz MSS group of applicants includes a new entrant who is close to completion of its system under a license issues in another country, new entrants with no existing systems, and existing 1.6/2.4 GHz licensees who plan to include the 2 GHz MSS bands in their next generation of satellites. Indeed, even the Commission recognizes the differences in implementation schedules.

Constellation believes that the current milestone structure for 1.6/2.4 GHz MSS systems is appropriate for 2 GHz MSS systems. However, the date on which the milestones schedule starts needs to be tailored to each licensee based on its current position. For example, for new entrants with no existing facilities, the milestone schedule can begin on the date of the license grant. However, for existing 1.6/2.4 GHz MSS licensees, the milestone schedule should begin at a date tailored to fit into a second generation or follow-on system launch scenario.

The reason for this is based on the practicalities of financing multi-billion dollar satellite systems. No one company is going to fully fund a multi-billion dollar system out of its own assets. As a result, much of the capital for such new 2 GHz MSS systems will have to be raised in private and public capital markets. It will be very difficult for any system operator to finance two systems at the same time. With a system lifetime of 5 to 7 years for a low earth orbit ("LEO") system, full system construction is unlikely to begin

until about three years prior to the end of the first generation system. Moreover, it will be easier to finance a follow-on NGSO system under more favorable financial terms after the initial system is operational.

In this regard, significant economies in satellite bus design and launch services may be possible by combining 2 GHz MSS capabilities in the follow-on system to an initial 1.6/2.4 GHz satellite system as currently licensed by the Commission. Thus, the Commission should not force existing 1.6/2.4 GHz MSS licensees into premature design and construction of 2 GHz MSS facilities which may force inefficient and higher cost designs or may not be financeable under current market conditions.

Consequently, Constellation believes that milestone schedules for existing 1.6/2.4 GHz MSS licensees should begin three years prior to the end of life of the initial constellation of satellites. For example, Constellation's current license requires that its system be fully operational by July 2003 and the estimated lifetime of its satellites is 5 years. Under Constellation's proposal, the milestone schedule for its 2 GHz MSS system would start on July 2003 + 5 years (satellite lifetime) – 3 years = July 2005.

A similar type of due diligence should be applied to LOI applicants to determine whether spectrum assigned to them in the 2 GHz MSS frequency assignment plan should be released for re-assignment to the other remaining systems. However, this can probably be accomplished using the ITU coordination procedures.

B. The Commission Should Not Impose E911 Obligations On the 2 GHz MSS At This Time

Constellation believes that it is premature for the Commission to impose enhanced 9-1-1 ("E911") obligations on MSS operators within the United States. Unlike a cellular system in which E911 capabilities can be applied on a cell-by-cell or local

jurisdictional basis, Constellation's MSS system will cover the entire country, including large unpopulated areas where there may not be a designated agency to respond to emergency calls. If an MSS system is to offer E911 service to its customers, the operator will have to know where to route the call for every point within the country. A commercial MSS operator can not be left with the liability of determining how to process an emergency E911 call other than routing it to a predetermined agency responsible for actually responding to the call. However, it does not appear that the relevant safety authorities have developed a nationwide plan to insure that there is a responsible agency for every point within the country, or a method for recovering the costs of a satellite provided service on a national basis. Any consideration of this matter should be deferred to a different proceeding in the future after sufficient experience has been gained with operational MSS systems and a nationwide infrastructure of Public Safety Answering Points and cost recovery mechanism has been developed.[26]

C. The Commission Should Not Adopt Any Special Provisions Regarding Unserved Communities Since All MSS Systems Are Inherently Capable Of Providing Such Service

Constellation does not believe it would be appropriate to establish policies that would treat applicants differently based on a concept of service to "unserved communities."[27] It is not clear exactly how an unserved community would be defined, and the Commission would have to insert itself into competitive market conditions to decide who to reward and how.

---

26 *See also* Comments of Constellation Communications, Inc. filed June 24, 1999 in IB Docket No. 99-67.

27 *See Notice* at ¶ 95.

MSS systems are inherently designed to provide service to areas not covered by terrestrial facilities, and this is one of the bases of Constellation's, as well as other MSS applicants', business plan. Users in remote areas will have access to the full range of satellite services offered over the Constellation system. Constellation believes that other 2 GHz MSS systems will have a similar focus. Thus, licensing multiple systems in a competitive market is a better means of ensuring reasonably priced telecommunications service to unserved areas than distorting market considerations with regulatory preferences.

D. The Commission Should Not Establish Any Specific Requirements Relating To Orbital Debris Mitigation

Constellation shares the concerns of the Commission and other involved government agencies concerning orbital debris and its mitigation. Constellation supports the policy statement attached to the Notice and intends to implement it to the extent practicable.

However, it should be noted that it is not practical to remove Constellation's satellites from orbit after their useful lifetime. The nominal 2,000 km altitude of the Constellation satellites would require far too much fuel to provide the delta-V needed to reduce the altitude to a low enough value to allow atmospheric drag to force the satellites to re-enter the atmosphere. Thus, Constellation plans to dispose of its satellites in a higher altitude where the high radiation levels of the Van Allen Belts are undesirable for satellite operations and minimize problems with other satellite systems.

Constellation sees no need for the Commission to adopt any regulatory provisions regarding orbital debris mitigation. Certainly, this proceeding to license 2 GHz MSS systems is not the appropriate proceeding to address the general issue of orbital debris

mitigation which is of concern to the satellite industry in general. Constellation believes that it and other satellite operators will apply the recommendations and establish a voluntary approach to minimizing orbital debris.

E. The Service Rules Covering 2 GHz MSS Earth Station Licensing Should Include GMPCS-MoU Provisions

Constellation also supports the general approach proposed for mobile earth station licensing by means of blanket licenses. However, 2 GHz MSS terminals are eligible for treatment under the GMPCS-MoU and associated arrangements. Accordingly, the 2 GHz MSS service rules should also include provisions for the proposed implementation of GMPCS-MoU.[28] However, Constellation does not believe there is any need for the Commission to specify requirements for position determination capabilities for 2 GHz MSS user terminals, more restrictive out-of-band emission limitation than proposed in the *Notice*, or any differences from current radiation hazard standards already specified in the Commission's rules.

CONCLUSION

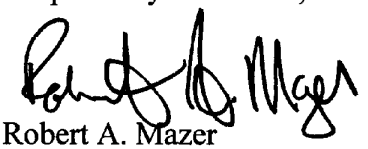
Constellation supports the Commission's efforts to establish processing procedures and service rules for the 2 GHz MSS Service. Constellation believes that all of the pending applications can be accommodated under a frequency assignment plan adopted by the Commission. Consequently, the Commission need not impose stringent financial qualifications standards for grant of a 2 GHz MSS license, but only realistic milestones matched to the stage of development of the applicant's existing systems before the initial assignment is reassigned to the remaining 2 GHz MSS systems for this

---

[28] *See* Comments of Constellation Communications, Inc. in IB Docket No. 99-67, filed June 24, 1999.

processing round. Such a frequency plan would combine an initial assignment of 3.75 MHz of service link spectrum in each direction to each applicant, together with a set of coordination and modification procedures that would provide flexibility in developing systems. Generally, the 1.6/2.4 GHz MSS service rules are a sound basis for the development of 2 GHz MSS service rules.

Respectfully submitted,



Robert A. Mazer
Albert Shuldiner
Counsel Vinson & Elkins L.L.P.
1455 Pennsylvania Avenue, N.W.
Washington, DC 20004-1008
(202) 639-6500
Counsel for Constellation Communications, Inc.

Dated: June 24, 1999

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 24th day of June, 1999, a true and correct copy of the foregoing Comments of Constellation Communications, Inc. was served by first class mail, postage prepaid, upon the following:

* Mr. Roderick Kelvin Porter
Acting Chief, International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554

* Ms. Fern J. Jarmulnek
Chief, Satellite &
Radiocommunication Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554

* Ms. Cassandra Thomas
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554

Mr. Bruce D. Jacobs
Mr. Glenn S. Richards
Fisher, Wayland, Cooper,
Leader & Zaragoza L.L.P.
2001 Pennsylvania Ave., N.W.
Suite 400
Washington, D.C. 20006-1851
Counsel for Personal
Communications Satellite Corporation

* Mr. Alex Roytblat
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554

* Mr. Harold Ng
Engineering Advisor
Satellite & Radiocommunications
Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554

* Mr. Thomas S. Tycz
Division Chief, Satellite &
Radiocommunication Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W., 6th Floor
Washington, D.C. 20554

Mr. Paul J. Sinderbrand
Mr. William W. Huber
Wilkinson, Barker, Knauer
& Quinn, L.L.P.
2300 N Street, N.W.
Washington, D.C. 20037-1128
Counsel for The Wireless Cable
Association International, Inc.

Mr. Peter M. Connolly
Koteen & Naftalin, L.L.P.
1150 Connecticut Avenue
Washington, D.C. 20036
Counsel for TMI Communications
and Company, Limited Partnership

Ms. Cheryl A. Tritt
Mr. Charles H. Kennedy
Ms. Sheryl J. Lincoln
Morrison & Foerster L.L.P.
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006-1888
Counsel for ICO Services Limited

Ms. Jill Abeshouse Stern
Sr. Vice President and General Counsel
Mr. Gerald B. Helman
Vice President, International and
Governmental Affairs
Mobile Communications Holdings, Inc.
Two Lafayette Center
1133 Twenty-first Street, N.W.
Washington, D.C. 20036

Mr. Warren Grace
Director General
Inmarsat
99 City Road
London EC1Y 1AX
United Kingdom

Mr. John C. Quale
Ms. Antoinette Cook Bush
Skadden, Arps, Slate,
Meagher & Flom L.L.P.
1440 New York Avenue, N.W.
Washington, D.C. 20005-2111
Counsel for Celsat America, Inc.

Mr. Thomas J. Keller
Mr. Julian L. Shepard
Mr. Eric T. Werner
Verner, Liipfert, Bernhard,
McPherson, and Hand, Chartered
901 - 15th Street, N.W., Suite 700
Washington, D.C. 20005-2301
Counsel for Iridium L.L.C.

Mr. Joseph P. Markoski
Mr. Herbert E. Marks
Mr. David A. Nall
Mr. Bruce A. Olcott
Squire, Sanders & Dempsey L.L.P.
1201 Pennsylvania Avenue, N.W.
P. O. Box 407
Washington, D.C. 20044-0407
Counsel for The Boeing Company

Mr. William Wallace
Crowell & Moring
1001 Pennsylvania Avenue, N.W.
Washington, D.C. 20004-2505
Counsel for Globalstar, L.P.

Mr. Mark A. Grannis
Harris, Wiltshire & Grannis L.L.P.
1200 Eighteenth Street, N.W.
Washington, D.C. 20036
Counsel for Teledesic LLC